

OCCURRENCE OF *WITTROCKIELLA PARADOXA* WILLE
(CHLOROPHYTA, CLADOPHORACEAE)
IN NORTHEASTERN NORTH AMERICA

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ABSTRACT

Wittrockiella paradoxa Wille (Chlorophyta, Cladophoraceae) is reported for the first time from northeastern North America, at Sam Orr Pond, New Brunswick, Canada. Vegetative plants were found from June-August, 1987, and reproductive plants (bearing aplanosporangia) were found in June and July, 1987. They occurred epiphytically on decaying *Spartina* leaves in an oligohaline-mesohaline saltmarsh habitat.

Key Words: *Wittrockiella*, Chlorophyta, new record, New Brunswick, Canada

INTRODUCTION

Wittrockiella paradoxa Wille (1909) is widespread in northwest Europe (Polderman, 1976), where the plants occur as epiphytes or endophytes on or in a variety of halophytes. Printz (1927) reported *W. paradoxa* from North America, but apart from this report, and South's (1981) description of a population from the San Juan Islands on the Pacific Coast of North America, little is known of its distribution in the New World.

In a recent study of the mat-forming micro-algae of a salt marsh in southern New Brunswick, Canada (Tracy and South, 1989), *Wittrockiella paradoxa* proved to be a frequently-occurring taxon; this discovery represents the first reported occurrence of *W. paradoxa* in eastern Canada, and the first in eastern North America since that of Printz (1927).

RESULTS AND DISCUSSION

Collections of *Wittrockiella paradoxa* were made from Sam Orr Pond, New Brunswick, during 1987. Samples were obtained from two permanent quadrat sites at 8.0 m and 6.9 m above low water mark; the sites are described in Tracy and South (1989). *Wittrockiella paradoxa* occurred in samples collected on May 7th, June 2nd, July 2nd and August 4th, 1987, and were restricted to the upper (8.0 m above low tide) quadrat.

Plants occurred on the mud surface or, preferably, in and on

the tissues of decaying halophytes, especially *Spartina* spp. Associated micro-algae included a variety of crustose and filamentous cyanobacteria, some other Chlorophyceae [*Rhizoclonium riparium* (Roth) Harvey, *Blidingia minima* (Naeg. ex Kuetz.) Klyin], and *Vaucheria* spp. (Tracy and South, 1989). Although plants occurred in most samples from the upper quadrat, they were sparsely distributed.

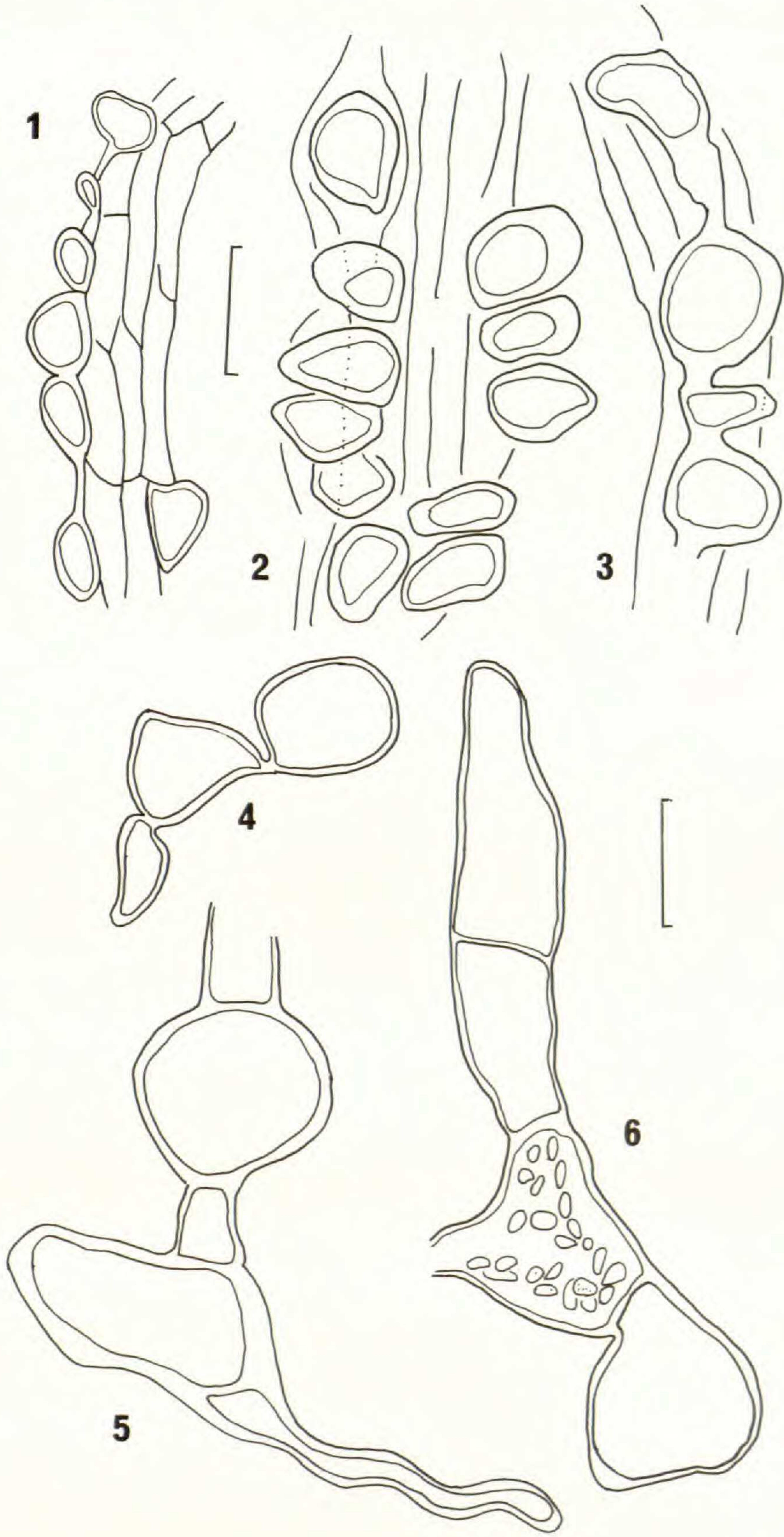
Sam Orr Pond *Wittrockiella paradoxa* (Figures 1–6) principally occurred as the ‘rhizoidal’ form (Wille, 1909; Polderman, 1976), the predominant form in European material (Polderman, 1976). Very few ‘cladophoroid’ plants were observed, in contrast to the predominance of this form described for the population at Sperry Marsh, Washington (South, 1981).

Plants closely resembled the rhizoidal forms described by Polderman (1976) and South (1981). Cells measured 30 (60) – 50 (100) μm and were light green; elongate cells [tending to the ‘cladophoroid’ form described in Polderman (1976) and South (1981)] contained a highly reticulate chloroplast with numerous discoid pyrenoids, the rhizoidal cells contained dense chloroplasts and accumulations of storage products. Cells were thick-walled and some possessed elongate rhizoid-like branches that anchored the filaments to the host plant surface (Figure 5). Plants were reproductive in the June and July, 1987, samples and the aplanosporangia closely resembled those described for European material by Polderman (1976). Aplanosporangia opened apically (Figure 6), and were either interspersed among the rhizoidal filaments or terminated a branch filament; aplanospores measured 8–10 μm . No hair cells were observed.

The upper quadrat site at Sam Orr Pond is subject to irregular tidal flooding. Temperature at the mud surface ranged from 6.5°C (May) to 25.5°C (August), and salinity of the surrounding water table ranged from 3.0‰ to 35.0‰, depending upon the most recent tidal flood cycle. These physical parameters seem to be in

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Figures 1–6. ‘Rhizoidal’ *Wittrockiella paradoxa* from Sam Orr Pond, New Brunswick. 1–3. Shown ‘in situ,’ attached to decayed leaf fragments of *Spartina*, August 4, 1987; 4. August 4, 1987; 5. June 6, 1987; 6. June 6, 1987, showing a partially emptied aplanosporangium. Scale bar = 50 μm .



accord with the oligohaline-mesohaline habitats described for the species in northwest Europe (Polderman, 1976).

It is likely that *Wittrockiella paradoxa* is more widespread than presently reported (South, 1981). The record from Printz (1927) is not well documented, and there are no subsequent records from eastern North America. Its cryptic habitat and possible confusion with other filamentous algae (e.g., *Vaucheria*) make its detection difficult, but it is surprising that *W. paradoxa* has not been reported in previous studies of northeastern North American salt-marshes.

ACKNOWLEDGMENTS

I am grateful to Ellen Tracy and Susan Nesbitt for assistance in the field and laboratory. Dr. C. J. O'Kelly, Massey University, kindly examined our material and confirmed the identification. The work was supported by Natural Sciences and Engineering Research Council grant A 2204.

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